

The coating structure and H₂ fill characteristics of Be micro shells produced by sputter coating with gas pulsing*

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The Inertial Confinement Fusion Program at Lawrence Livermore National Laboratory has a continuing interest in using Beryllium micro shells for their fusion experiments. Some of the important shell parameters are surface smoothness, tensile strength and permeation of hydrogen at different temperatures. Previously, we fabricated Be micro shells by sputtering Be on glass micro shell mandrels supported on a bouncing pan. The Be coating was reasonably smooth but highly columnar which affects the tensile strength and gas permeation. Recently, we found that the structure of a Be coating on a spherical substrate can be modified by gas pulsing during sputtering.

The purpose of the present study is to control the Be coating structure with gas pulsing and study the hydrogen fill characteristic of the micro shells as a function of the structures. We used polystyrene micro shells as mandrels and a miniature bouncing pan for the coating. Both nitrogen and hydrogen were used for gas pulsing. The structures of the Be layers under different coating conditions and their hydrogen fill characteristics will be reported.

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